REMARKS

A. Request for Reconsideration

Applicant has carefully considered the matters raised by the Examiner in the outstanding Office Action but remains of the position that patentable subject matter is present. Applicant respectfully requests reconsideration of the Examiner's position based on the amendments to the claims and the following remarks.

B. Claim Status and Amendments

Claims 4-7 and 9-10 are presented for further prosecution. Claims 1-3 are newly cancelled, without prejudice.

Claims 4 and 7 are amended to more particularly set forth that which Applicants consider to be their invention. The claims require that the elastomeric resin consists of a polymer selected from one of the enumerated polymers. Support for the polymers is found at page 4, lines 9-16, and NBR/PVC is supported by Example 4.

New claim 9 and 10 depend from claim 4 and 7, respectively, but omit the element of "NBR blended with polyvinyl chloride," from the Markush group.

No new matter was added.

C. The Invention

As previously explained, the present invention relates to an elastomeric compound having a high filler content of 15% to 500% by weight of the compound, which additionally contains 1 to 400% by weight of the compound of microsilica as a modifier to improve the processability.

As discussed in the specification, the "high filler loading" means an elastomeric compound having such a filler loading amount that the viscosity will increase to such a level that the compound can not be processed. The invention solves this processibility problem by adding 1 to 400 % by weight of microsilica to such a highly loaded elastomeric compounds already having a high filler content of 15% to 500% by weight.

The term microsilica used in the specification and claims is particulate amorphous SiO_2 obtained from a process in which silica is reduced to SiO-gas and the reduction product is oxidized in vapor phase to form amorphous silica. Microsilica may contain at least 70% by weight silica (SiO_2) and has a specific density of 2.1 - 2.3 g/cm^3 and a surface area of 15 - 50 mg^2/g.

D. Obviousness-Type Double Patenting Rejection

Claims 1-7 had been *provisionally* rejected as being obvious in view of the copending Application No. 11/718590.

Applicants request that the Examiner hold this Obviousness-type Double Patenting Rejection in abeyance until this case is ready for allowance.

E. Claim Rejections - 35 USC § 103

Claims 1-7 had been rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuhashi in view of Underwood.

Regarding Mitsuhashi

Mitsuhashi teaches a fire-retardant silicone rubber composition with 10-100 parts by weight silica powder, selected from mist silica, hydrophobic silica, set process silica and the end of quartz powder. The examiner takes the position that mist silica is fumed silica and fumed silica is microsilica. Applicant respectfully disagrees.

As recited in Claim 4, the present invention requires that the elastomeric resin comprises a polymer selected from the recited group of polymers. None of the recited group of polymers is a silicon-based polymer, thus

expressly excluding the disclosure of Mitsuhashi. For this reason alone, it is submitted that Mitsuhashi neither teaches nor suggests the claimed invention, taken alone or in any combination with other cited references. The Examiner has agreed with this conclusion at page 2, paragraph 3, of her Advisory Action dated December 16, 2009.

In addition, there is no mention of microsilica in Mitsuhashi. Mitsuhashi only discloses silica powders having a size less than 50 μm that are preferred. Compared with the preferred size of the microsilica in the present application, Mitsuhashi's silica powder comprises particles that are 330 times larger.

Therefore, the position that fumed silica is miscrosilica, has no support from Mitsuhashi or other literature.

The Examiner is respectfully requested to take notice that there are enormous varieties of silica powders with a particle size less than 50 μm that are commercially available. The art of record would have provided no

suggestion to the artisan to try the microsilica powder employed herein.

The question as to the identify and properties of the microsilica employed by the instant patent application, relative to other types of silica particles, can be settled by considering the provided Examples. The microsilica employed in the instant Examples simply does not behave in the same way as other silicas.

For instance, in Example 2, chloroprene rubber was prepared with 50 phr-precipitated silica having a surface area of $125m^2/g$. The process was repeated wherein 20 phr of the precipitated silica was replaced with 30 phr of microsilica. As evidenced by Table 2, the composition prepared with precipitated silica exhibited a Mooney viscosity at 120°C of 41.0. When 30 phr of precipitated silica was replaced by microsilica, the resulting composition exhibited a significantly lower Mooney viscosity at 120°C of 25.7.

In Example 3, solution styrene-butadiene rubber (SBR) was prepared with 80phr of highly dispersable precipitated silica having a surface area of $125m^2/g$. A second

composition was prepared from 80phr of the precipated silica and 20phr microsilica. This composition was compared to an SBR mixture with 100phr of the precipitated silica. As evidenced by Table 3, the Mooney viscosity at 100°C was highest for SBR with 117phr precipitated silica, lower for 80phr precipitated silica plus 20phr microsilica, and lowest still with SBR and 80phr precipitated silica.

The same results are provided by Example 5, Table 5, where natural rubber (SIR 20) was filled with 50phr of carbon black, 100phr of carbon black, 50phr of carbon black plus 50phr of pricipated silica, and 50phr of carbon black and 50phr of microsilica. Table 5 confirms that the lowest Mooney viscosity readings, at 100°C were obtained in the composition with the microsilica.

Thus, the above-noted Examples confirm that the microsilica according to the invention has different properties than the other silicas, such as precipitated silica.

Therefore it is submitted that Mitsuhashi does not teach or suggest using microsilica in its compositions.

For all of these reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

Underwood

The Examiner cited Underwood to teach a particulate amorphous silica and asserted that the combination of Mitsuhashi and Underwood reaches the claimed invention.

i. Underwood can not be combined with Mitsuhashi

Underwood teaches a solid resin composition of a **thermoplastic** resin and particulate amorphous silica as a filler. Underwood does not relate to **elastomeric** resins, such as the cross-linking treated silicon rubber in Mituhashi, although it is stated that the thermoplastic can include elastomers. Underwood clearly states (see column 2, lines 40-46, emphasis added):

> The so-called thermoplastic rubbers (thermoelastomers) [are] also included, since, as they include elastomeric domains and thermoplastic domains in the same polymer, they can be regarded as an "internal blend" of a thermoplastic resin and an elastomer. Despite their name, the thermoplastic rubbers are to be regarded as plastics rather than rubbers as such, since no vulcanization is used in their manufacture."

It is well known to the artisan that the vulcanization or cross-linking process is a thermoset process, which is contrasted strongly with thermoplastic processes, a melt-freeze process. Mitsuhashi requires cross-linking treatment by adding a cross-linking accelerator platinum catalyst and a cross-linking agent, such as monotmethylsilane (Paragraph [0009-0011] of Mitsuhashi). Thus, Mitsuhashi relates only to **cured rubber compounds** by an irreversible cross-linking reaction.

The cross-linking treatment in Mitsuhashi places Mitsuhashi outside the coverage of thermoplastic materials taught by Underwood. Since the silicone rubber material in Mitsuhashi is a thermoset material, which does not melt on heating as will the thermoplastic material in Underwood, it is respectfully submitted that Underwood cannot be combined with Mitsuhashi.

ii. The combination of Underwood and Mitsuhashi does not teach adding microsilica to improve the processability of elastomers already having "high filler content".

It should be pointed out that none of the examples in Underwood contains high conventional filler content in addition to microsilica for processability.

The present invention relates to highly filled elastomeric compositions which contain conventional fillers and have microsilica as a processing agent. The high filler loading in the application increases the viscosity to a level where the processabillity is strongly reduced, which makes it impossible to process the composition. The addition of microsilica as a processing agent in the present invention solves this problem.

Underwood does not teach or suggest that microsilica can be used as a processing agent. Underwood teaches the use of microsilica as a filler replacing conventional filler (calcium carbonate) in PVC. This is evident from all the compositions in the examples of Underwood; see Tables 3, 7, 8, 9 and 10. The advantages of the compositions according to the present invention compared to Underwood is that the present invention makes it possible to use very high amount of conventional filler and maintain excellent processability (e.g., see above discussion of viscosity) by adding microsilica.

Mitsuhashi does not suggest or imply a step of forming a highly filled elastomeric compound first and then adding microsilica to modify its processability either. Mitsuhashi does not teach a method for producing a highly filled elastomeric compound by adding this specific microsilica, nor does it teach a method of using the specific microsilica as a modifier to improve processability of a highly filled elastomeric compound.

It is respectfully submitted that it is not obvious from Mitsuhashi and Underwood to use the specific microsilica as claimed, to improve the processibility of a highly filled elastomeric composition. Therefore, the present invention as claimed in Claim 1-7 is patentable over Mitsuhashi and Underwood, taken alone or in any combination.

On a final note, the Examiner has suggested, at page 3, of her Advisory Action dated December 16, 2009, that Underwood can be further combined with Badum (US 2,297,194) and/or Emmett, 1944 (Industrial Engineering Cehmistry 36:730-34. While neither Badum nor Emmett have been formally made of record, it is respectfully urged that the

claims must be viewed as a whole, and for the reasons discussed above, the combination of microsilica with, e.g., NBR/PVC, as an additional filler, is not taught or suggested by the art of record, or by references teaching only a blend of NBR with PVC.

E. Conclusion

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance and such action is respectfully requested. Should any extensions of time or fees be necessary in order to maintain this Application in pending condition, appropriate requests are hereby made and authorization is given to debit account #02-2275.

Respectfully submitted,

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